REMARKS

A new Abstract has been provided including among other things an indication that the temperature of the film-forming process is lowered. This revision should overcome the Examiner's concern expressed in the Office Action.

The rejection of claims 1 to 11 under the second paragraph of 35 USC 112, if applied to the claims as amended, is respectfully traversed. Claim 1 has been rewritten and claims 6 and 8 to 10 have been amended to conform to the amendments to claim 1. The Examiner will note that claim 10 is now written in independent form.

The Examiner's comment regarding the term "quasi-stable" is noted. The term has been changed to read "metastable excited state." By way of example, applicant points out that oxygen molecules in a mixture of krypton gas and oxygen can be given a metastable excited state causing the oxygen molecules to be at a higher energy level such as O^3P, O^1D, O^3S, and the like. In such a state, the oxygen molecules are dissociated into atomic-like elements almost without being ionized into a plasma state. A metastable excited state is a state of excitation where given gas molecules are excited to a higher energy level without ionization. The Examiner is referred to the discussion at pages 5 and 6 of the

specification and the enclosed articles discussed in more detail below with respect to the prior art rejection.

It is respectfully submitted that the claims now comply with the formal requirements of the Patent Code. The Examiner is requested to telephone the undersigned should further changes be deemed appropriate.

The rejection of claims 1 to 11 under 35 USC 103 as unpatentable over JP '898 or Hudgens et al. '379, if applied to the claims as amended, is respectfully traversed. Claim 1 has been amended to require that at least one of krypton and xenon is included in the inert gas composition. If a silica film is made using a mixture of krypton gas and an oxygen gas in accordance with the present invention, the thickness of the film with oxidation time is enhanced as compared to use of a mixture of an argon gas, a neon gas or a helium gas and an oxygen gas as shown in Fig. 4 of the enclosed article by Ueno et al. entitled "Low Temperature Oxidation of Silicon(100) Substrates Using Atomic Oxygen." See also Fig. 2 of the enclosed Ueno et al. article entitled "Low Temperature and Low-Temperature and Low-Activation-Energy Process for the Gate Oxidation of Si Substrates." The first named author is the inventor here.

Applicant has also determined that, using a mixture of a krypton gas and an oxygen gas in SiO_2 film formation, one can achieve enhanced distributions of the interfaced trap density (Dits) at the SiO_2/Si interface when compared to a SiO_2 film using a mixture of argon gas and oxygen gas; see Fig. 6 of the first Ueno et al. article and Fig. 4 of the second Ueno et al. article.

In the cited art, only an argon gas is employed as inert gas. There is no discussion of using krypton or xenon as a gas in the process. Thus, the references do not teach or suggest the invention as claimed and the rejection should be withdrawn.

The Examiner is thanked for acknowledging that certified copies of the priority documents have been received from the International Bureau and for listing the references provided in an Information Disclosure Statement.

In view of the foregoing revisions and remarks, it is respectfully submitted that claims 1 to 11 are in condition for allowance and a USPTO paper to those ends is earnestly solicited.

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The Examiner is requested to telephone the undersigned if further changes are required prior to allowance.

Respectfully submitted,

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Date

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Enclosure:
Two Ueno et al. articles

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MARK UP

(Amended)

1. A film-forming method of supplying gaseous molecules, each composed of plural atoms, onto a substrate[, wherein the plasma composed of the mixed gas of an inert gas and the gas containing the gaseous molecules is generated to excite the inert gaseous molecules, and the excited inert gaseous molecules having higher quasi-stable level energies than the ones requiring to dissociate the gaseous molecules into their atomicity elements are collided with the gaseous molecules to dissociate them into their atomicity gaseous elements to supply the elements onto the substrate].

, said film-forming method comprising:

providing a substrate;

providing a mixture of an inert gas component containing at least one of a Kr gas and a Xe gas and a gas component containing said gaseous molecules;

generating a plasma of said mixture, to excite molecules of said inert gas, and thus, to excite said gaseous molecules through the collision between said excited molecules of said inert gas and said gaseous molecules to metastable excited state which is required to dissociate said gaseous molecules into their respective elements; and

supplying said elements of said gaseous molecules onto said substrate.

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(Amended)

6. A film-forming method as defined in claim 5, wherein at least a part of the silicon elements constituting the silicon compound are dissociated into [the atomicity] silicon elements.

(Amended)

8. A film-forming method as defined in claim 7, wherein the inert gas is krypton gas and the gaseous molecules are oxygen molecules to be dissociated into [the atomicity] an oxygen element to oxidize the substrate.

(Amended)

9. A film-forming method as defined in claim 7, wherein the inert gas is xenon gas and the gaseous molecules are oxygen molecules to be dissociated into [the atomicity] oxygen elements to oxidize the substrate.

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(amended)

10. A film-forming method as defined in claim 5, wherein the silicon compound is a silicon nitride and the inert gas is helium gas, and the gaseous molecules are nitrogen molecules to be dissociated into the atomicity nitrogen elements to nitride the substrate.

of supplying gaseous molecules, each composed of plural atoms, onto a substrate, said film-forming method comprising:

providing a substrate;

providing a mixture of an inert gas component containing at least one of a Kr gas and a Xe gas and a gas component containing said gaseous molecules;

generating a plasma of said mixture, to excite molecules of said inert gas, and thus, to excite said gaseous molecules through the collision between said excited molecules of said inert gas and said gaseous molecules to metastable excited state which is required to dissociate said gaseous molecules into their respective elements; and

supplying said elements of said gaseous molecules onto said substrate,

said substrate being a silicon substrate;

said gaseous molecules containing Si elements and nitrogen molecules to be dissociated into their respective elements;

said inert gas component further containing a He gas.